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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/555,924

11/08/2005

Naoya Matsuoka

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MCDERMOTT WILL & EMERY LLP  
600 13TH STREET, N.W.  
WASHINGTON, DC 20005-3096

EXAMINER

KALAFUT, STEPHEN J

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/555,924	<b>Applicant(s)</b> MATSUOKA, NAOYA	
	<b>Examiner</b> Stephen J. Kalafut	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-31 is/are allowed.
- 6) ☒ Claim(s) 1,32 and 33 is/are rejected.
- 7) ☒ Claim(s) 2-13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 November 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>08 Nov 2005</u> . | 6) <input type="checkbox"/> Other: ____.  |

Art Unit: 1795

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Isenberg (US 4,664,987).

Isenberg discloses a fuel cell stack comprising smaller cells (13) in its central region and larger cells (12) disposed other than in the center. While cells in one planar unit are connected in parallel, each planar unit is connected to the next unit in series (column 3, lines 56-61). Thus, the stack comprises series-connected cells. While the ceramic materials of these solid oxide cells (column 1, lines 22-29) would not have a large capacity to absorb moisture, the larger cells would have a greater degree of moisture absorption capacity, simply because they are larger.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isenberg in of Watanabe (US 5,846,668).

Art Unit: 1795

Claim 32 differs from Isenberg by reciting that the cross sectional area of the gas passage of the cell away from the center is larger than that of the cell in the center. Claim 33 additionally differs in that the flow rate of the gas supply to the cell away from the center is larger than that of the cell in the center. Watanabe teaches that larger cross sectional area for a gas passage may be used to obtain a greater amount of gas supply (column 5, lines 14-19). Because some of the cells (12) of Isenberg are larger than other cells (13), they would need a greater amount of gas reactants. It would thus be obvious to supply greater amounts of gas to the larger cells, and to use gas passages of larger cross sectional area, as taught by Watanabe.

Claims 2-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. While the larger cells of Isenberg would have a larger capacity to absorb moisture, this would be an inherent property, rather than an explicit one. The cells are also of the solid oxide variety, in which a ceramic electrolyte conducts oxygen ions. Thus, the use of an electrolyte membrane that conducts hydrogen ions; a humidifier or plurality thereof; a sensor and controller that respond to moisture content; a temperature sensor and controller that is programmed to maintain constant output current when the fuel cell stack is at a lower temperature during startup; or a moisture purge device responsive to temperature would not be taught by the prior art as an obvious modification to the system of Isenberg.

Art Unit: 1795

Claims 14-31 are allowed. These claims also recite a membrane that conducts hydrogen ions, in a fuel cell stack in which a cell away from the center of the stack has a larger moisture absorption capacity than a cell at the center.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wilkinson *et al.* (US 5,252,410) disclose a polymer electrolyte fuel cell stack that includes humidification assemblies (14) that humidify incoming gas. Cisar *et al.* (US 6,838,205) disclose fuel cell electrodes in which the diffusion backing layer has interspersed hydrophilic and hydrophobic regions. The prior art cited in the International Search Report has been reviewed, but none of the references, including those marked with a "Y", disclose a fuel cell stack in which a cell away from the center has a higher moisture absorption capacity than a cell in the center.

The use of the trademarks Nafion and Dowex has been noted in this application. They should be capitalized wherever they appear and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

These trademarks are used, for example, on page 12, line 14. They are properly capitalized, but are not accompanied by the corresponding generics terms.

The disclosure is objected to because of the following informalities: The drawing numerals 12 and 19 are not found in the specification. Appropriate correction is required.

Art Unit: 1795

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is 571-272-1286.

The examiner can normally be reached on Mon-Fri 8:00 am-4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Stephen J. Kalafut/  
Primary Examiner, Art Unit 1795